Section V
Conservation Effects for Decisionmaking
Case Study 3

Reduced Tillage on a Grain Farm

Cayuga County, Farm #3

Resource setting

This is a medium-sized grain farm in Cayuga County. Soils on this farm are of many associations, since the farm covers so many acres. Most of the soils are considered highly erodible, which has forced Farmer 3 to include hay in his crop mix to decrease sheet erosion levels. Farm is on rolling terrain in northern end of county. Crops grown are:

Corn grain		284 acres
Corn silage		16 acres
Soybeans		200 acres
Oats		45 acres
Rye		30 acres
Sudangrass :		12 acres
Hay	:	115 acres

Total		700 acres

The farm is primarily involved with grain production, but Farmer 3 also run 115 head of beef stock (of which, 38 are cows), which is why the corn silage is grown. Hay is being grown partly for the livestock, but mostly to remain eligible for USDA benefits. He was forced to begin hay production to decrease erosion levels. The rye is grown for straw to sell to horseracing tracks. The sudangrass is greenchopped for the livestock.

Farmer 3 runs a corn grain (3 years), soybeans (1 year), small grains (2 years) on non-HEL land. He changes it to either remove soybeans completely on some HEL ground, or add hay to the rotation on other HEL land. The rotation on HEL ground is fixed for a field, as required by his conservation plan. For non-HEL ground, though, he changes his rotation to whatever is needed for his crop mix.

Practices installed

Farmer 3 uses conservation tillage. All of his crop production is either notill or chisel/disk. Farmer 3 has always used conservation tillage, so construction of a benchmark crop budget will be a hypothetical conventional tillage budget for his major crops.

Resource problems

Farmer 3 states that any consideration for erosion on the farm was definitely secondary to the time savings involved with conservation tillage. He never worried about erosion until the 1985

Farm Bill made it an issue. Still, even with the Food Security Act, he is not particularly concerned about erosion. He only grows hay to remain eligible for benefits. The time savings with conservation tillage were what attracted him to this practice.

Consequently, the format of the case study will be somewhat changed. The focus will be the crop budgets, along with the farmer's impressions of his operation. Actual production activities become more important when analyzing conservation tillage, so these will be discussed in more detail than case studies of other practices.

General impressions

Farmer 3 is moving out of small grain production. His acreage for these has dropped over the years and until recently, had been absorbed by the soybean enterprise. Now, with FSA, he has had to cut back on soybean acreage and is consequently rethinking his involvement with any USDA programs. He believes that in his case, mandatory compliance with erosion control programs might force him to discontinue his voluntary cooperation with SCS.

He has had mixed results using notill on corn. He states that it is hard to establish a good stand on his farm. On gravely ground, he cannot get good seed coverage. On gravel/sands, seed placement tends to be too deep. Notilling into corn stubble has left him ambivalent and he has not tried notilling into sod. I mentioned that several farmers in Madison County had tried this with good results, believing that the practice may have the effect of not bringing weed seeds to the surface to germinate. He said that he could agree with the logic of this and would consider using the practice next year, depending on the results of his own research.

Farmer 3 uses no conventional tillage at all. The closest he comes is to chisel, take two passes with a field cultivator, and plant. Taking the second pass with the field cultivator allows for better seed contact and germination. He adjusts planting depth with the time of the year (warmer weather leading to deeper seed placement), but never over two inches.

Production activities (major crops)

1) Corn after hay - chisels twice, cultivates twice, plants. Farmer 3 varies the population depending on the variety. A flexible ear variety will be planted at 26,200 while a determinate ear variety will be planted at 28,000. He sprays at planting with a sprayer that is integral with the planter. He uses fertilizer according to soil test in the field, and tests the fields every three years. Most

commonly, he will use varying amounts (140 to 170 lbs.) of 11-26-10 with zinc.

He then broadcasts potash or 7-18-36 at 200 to 300 lbs. per acre, depending on soil test. Sidedressing anhydrous ammonia comes next, 80 to 140 lbs. of actual N. He scouts for weeds at this time and determines what needs spot spraying. About half of the acreage gets sprayed twice. The corn is then combined.

If silage is grown, the production activities remain the same, but the population is changed to 30,200.

2) Corn after beans. Notills corn, no difference in chemical regimen. He may use more Bladex or Atrazine. At a cost of over $20 per acre, he believes that an extra tillage pass may be more profitable than using Gramoxone for chemical weed control. He does not notill corn on wet fields, though. He says that this idea is unworkable, that notill should only be used on a well-drained fields and that statements to the effect that notill allows one to plant in a wet year are all wrong.

3) Soybeans. All tillage activities are the same as for corn after hay. Uses a drill and flexible tine harrow/roller combination that he made himself. This harrow gives good chemical incorporation, pushes rocks down. Fertilizer used is commonly a mixture of 3-14-34 at 150 to 300 lbs. depending on soil test. He is leaning toward use of 7-18-36 since that is his fertilizer of choice for corn and can also be used on hay. He uses a postemergent spray, but is not happy with Lorox or Sencor. He is thinking of not using any preemergent broadleaf weedkiller at all. Beans are combined.

4) Hay. Nothing unusual is done here. He chisels twice, cultivates twice and plants. Roundbales are used, not haylage. He has been clear-seeding, but may go back seeding through oats. The problem here is that he has to work the ground twice.

Effects of practice (conservation tillage)

The biggest effect of conservation tillage for Farmer 3 is the time savings it offers. He states that he would not be able to work nearly as much land if he were using conventional tillage. He worked full-time in construction up to three years ago and the time savings were crucial in his ability to maintain profitability with a limited window of opportunity for timely crop production activities.

He has used conservation tillage since 1978, when he began farming. Over the years, he says that he notices a yield advantage to conventional tillage, but states that there is no economic

advantage since the time spent in operations for conventional tillage are greater. He recognizes the value of his time and explicitly considers this a cost to the operation. This is to be expected, since he has a lucrative off-farm job that he engages in when not actually performing crop production activities. The opportunity cost of his time, therefore, is high and he would naturally consider this.

Conservation tillage has allowed him to be more timely in all operations, which results in better yields. He states that so far as he is concerned, it is better to be timely and work efficiently and effectively than to simply work more acreage. He is farming as much acreage as he can by himself and is considering putting on more acreage and hiring some full-time help.

Yields on his farm this year are better than in surrounding areas. The corn will go about 90 bushels per acre (dry shell basis) and the soybeans will be about 40 bushels per acre. He attributes this not to conservation tillage so much as to getting the right amounts of rain at the right time. Plant populations, though, are excellent, more uniform than in the past. He attributes his previous problems with plant populations to poor seedbed preparation, not tillage.

Chiseling and the ripper he constructed have also improved drainage. He runs the chisel fairly shallow (10 inches) and finds that the field cultivator will tend to develop a plow sole. This can be corrected fairly easily, though, with a deep chiseling run.

Conservation tillage has improved his organic matter and soil tilth. Organic matter has gone from 1% to 3%, resulting in better yields.

Crop budget analysis

Again, since Farmer 3 has always used conservation tillage, a hypothetical crop budget needed to be constructed to show a benchmark.